

5.0 Site Parameters

Table 5.0-1 identifies the key site parameters that are specified for the design of safety-related aspects of structures, systems, and components for the AP1000. An actual site is acceptable if its site characteristics fall within the AP1000 plant site design parameters in Table 5.0-1.

Table 5.0-1 Site Parameters	
Maximum Ground Water Level	Plant elevation 98 ft
Maximum Flood Level	Plant elevation 100 ft (design grade elevation)
Precipitation	
Rain	19.4 in./hr (6.3 in./5 min)
Snow/Ice	Ground snow load of 75 lb/ft ² with exposure factor of 1.0 and importance factor of 1.2
Air Temperature	Limits based on historical data excluding peaks of less than 2 hours duration Maximum temperature of 115° dry bulb/80°F coincident wet bulb Maximum wet bulb 85.5°F (noncoincident) Minimum temperature of -40°F
Tornado	
Wind Speed	Maximum wind speed of 300 mph
Maximum Pressure Differential	Maximum pressure differential of 2.0 lb/in ²
Tornado Missile Spectra	4000-lb automobile at 105 mph horizontal, 74 mph vertical 275-lb, 8-in. shell at 105 mph horizontal, 74 mph vertical 1-in.-diameter steel ball at 105 mph in the most damaging direction

Table 5.0-1 (cont.) Site Parameters	
Soil	
Average Allowable Static Soil Bearing Capacity	Greater than or equal to 8,600 lb/ft ² over the footprint of the nuclear island at its excavation depth
Maximum Allowable Dynamic Bearing Capacity for Normal Plus Safe Shutdown Earthquake (SSE)	Greater than or equal to 35,000 lb/ft ² at the edge of the nuclear island at its excavation depth
Lateral Variability	<p>Soils supporting the nuclear island should not have extreme variations in subgrade stiffness.</p> <p>Case 1: For a layer with a low strain shear wave velocity greater than or equal to 2500 feet per second, the layer should have approximately uniform thickness, should have a dip not greater than 20 degrees, and should have less than 20 percent variation in the shear wave velocity from the average velocity in any layer.</p> <p>Case 2: For a layer with a low strain shear wave velocity less than 2500 feet per second, the layer should have approximately uniform thickness, should have a dip not greater than 20 degrees, and should have less than 10 percent variation in the shear wave velocity from the average velocity in any layer.</p>
Shear Wave Velocity	Greater than or equal to 1000 ft/sec based on low-strain, best-estimate soil properties over the footprint of the nuclear island at its excavation depth
Liquefaction Potential	None
Seismic	
SSE	SSE free field peak ground acceleration of 0.30 g with modified Regulatory Guide 1.60 response spectra (See Figures 5.0-1 and 5.0-2.). Seismic input is defined at finished grade except for sites where the nuclear island is founded on hard rock.
Fault Displacement Potential	None

Table 5.0-1 (cont.) Site Parameters	
Atmospheric Dispersion Factors (X/Q)	
Site Boundary (0-2 hr)	$\leq 1.0 \times 10^{-3} \text{ sec/m}^3$
Site Boundary (annual average)	$\leq 2.0 \times 10^{-5} \text{ sec/m}^3$
Low Population Zone Boundary	
0 - 8 hr	$\leq 2.2 \times 10^{-4} \text{ sec/m}^3$
8 - 24 hr	$\leq 1.6 \times 10^{-4} \text{ sec/m}^3$
24 - 96 hr	$\leq 1.0 \times 10^{-4} \text{ sec/m}^3$
96 - 720 hr	$\leq 8.0 \times 10^{-5} \text{ sec/m}^3$

Table 5.0-1 (cont.) Site Parameters					
Control Room Atmospheric Dispersion Factors (χ/Q) for Accident Dose Analysis					
χ/Q (s/m ³) at HVAC Intake for the Identified Release Points ⁽¹⁾					
	Plant Vent or PCS Air Diffuser⁽³⁾	Ground Level Containment Release Points⁽⁴⁾	PORV and Safety Valve Releases⁽⁵⁾	Steam Line Break Releases	Fuel Handling Area⁽⁶⁾
0 - 2 hours	3.0E-3	6.0E-3	2.0E-2	2.4E-2	6.0E-3
2 - 8 hours	2.5E-3	4.5E-3	1.8E-2	2.0E-2	4.0E-3
8 - 24 hours	1.0E-3	2.0E-3	7.0E-3	7.5E-3	2.0E-3
1 - 4 days	8.0E-4	1.8E-3	5.0E-3	5.5E-3	1.5E-3
4 - 30 days	6.0E-4	1.5E-3	4.5E-3	5.0E-3	1.0E-3
χ/Q (s/m ³) at Control Room Door for the Identified Release Points ⁽²⁾					
0 - 2 hours	1.0E-3	1.0E-3	4.0E-3	4.0E-3	6.0E-3
2 - 8 hours	7.5E-4	7.5E-4	3.2E-3	3.2E-3	4.0E-3
8 - 24 hours	3.5E-4	3.5E-4	1.2E-3	1.2E-3	2.0E-3
1 - 4 days	2.8E-4	2.8E-4	1.0E-3	1.0E-3	1.5E-3
4 - 30 days	2.5E-4	2.5E-4	8.0E-4	8.0E-4	1.0E-3

Notes:

1. These dispersion factors are to be used 1) for the time period preceding the isolation of the main control room and actuation of the emergency habitability system, 2) for the time after 72 hours when the compressed air supply in the emergency habitability system would be exhausted and outside air would be drawn into the main control room, and 3) for the determination of control room doses when the nonsafety ventilation system is assumed to remain operable such that the emergency habitability system is not actuated.
2. These dispersion factors are to be used when the emergency habitability system is in operation and the only path for outside air to enter the main control room is that due to ingress/egress.
3. These dispersion factors are used for analysis of the doses due to a postulated small line break outside of containment. The plant vent and PCS air diffuser are potential release paths for other postulated events (loss-of-coolant accident, rod ejection accident, and fuel handling accident inside the containment); however, the values are bounded by the dispersion factors for ground level releases.
4. The listed values represent modeling the containment shell as a diffuse area source, and are used for evaluating the doses in the main control room for a loss-of-coolant accident, for the containment leakage of activity following a rod ejection accident, and for a fuel handling accident occurring inside the containment.
5. The listed values bound the dispersion factors for releases from the steam line safety and power-operated relief valves, and the condenser air removal stack. These dispersion factors would be used for evaluating the doses in the main control room for a steam generator tube rupture, a main steam line break, a locked reactor coolant pump rotor, and the secondary side release from a rod ejection accident. Additionally, these dispersion coefficients are conservative for the small line break outside containment.
6. The listed values bound the dispersion factors for releases from the fuel storage and handling area. The listed values also bound the dispersion factors for releases from the fuel storage area in the event that spent fuel boiling occurs and the fuel building relief panel opens on high temperature. These dispersion factors are used for the fuel handling accident occurring outside containment and for evaluating the impact of releases associated with spent fuel pool boiling.

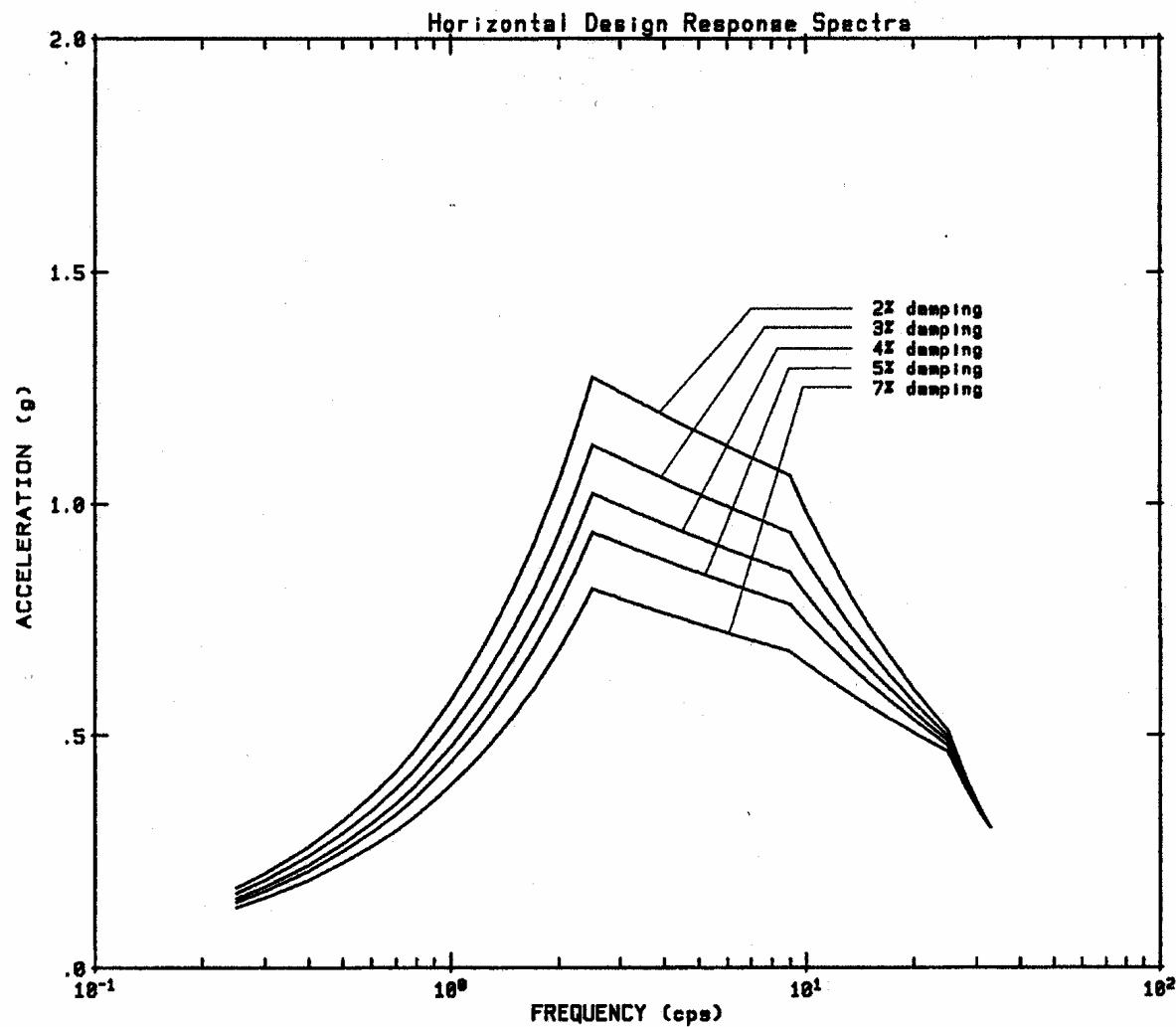


Figure 5.0-1
Horizontal Design Response Spectra
Safe Shutdown Earthquake

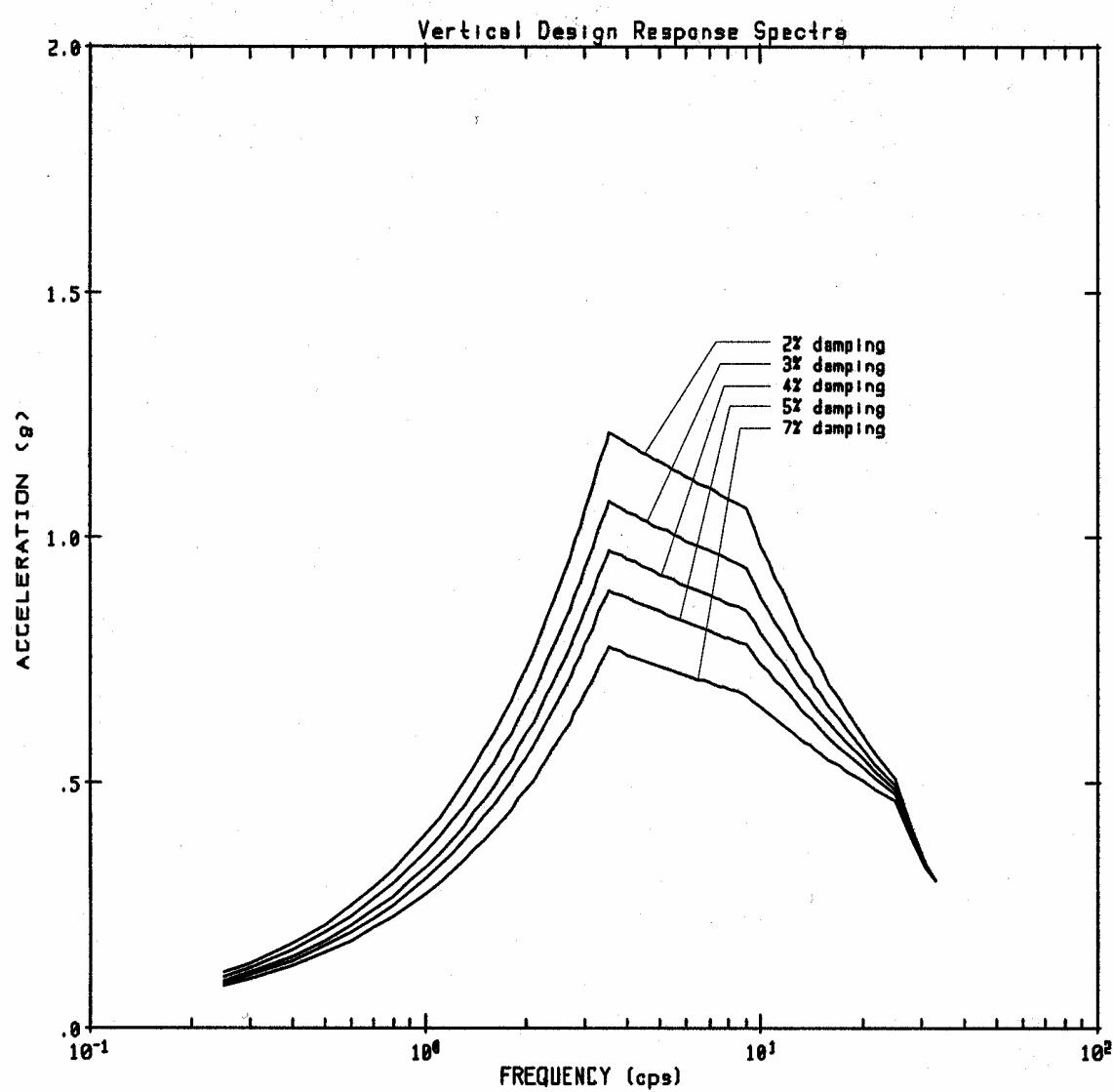


Figure 5.0-2
Vertical Design Response Spectra
Safe Shutdown Earthquake